Anthropology

Prehistoric human bones found in cave

Researchers announced this month that they have identified a partial skeleton found in a Colorado mountain cave as that of a 35- to 40-year-old man who died about 8,000 years ago.

Radiocarbon dating of the human remains indicates that they are among the oldest ever found in North America. The frozen man recently found in the Austrian Alps met his demise about 5,300 years ago (SN: 4/18/92, p.253). The new discovery also provides the earliest North American evidence of high-altitude human activity: The bones lay in a cave more than 10,000 feet above sea level.

"It was thought until recently that people from that time period [around 8,000 years ago] were only passing through this region by way of the mountain passes," says Patty Jo Watson of Washington University in St. Louis, lead archaeologist on the 19-member team that studied the ancient remains. "But this new evidence suggests that this man spent quite a bit of time in the area and clearly knew his way around."

The remains, discovered in 1988, include the skull cap, several arm and leg bones, a few ribs and vertebrae, pelvic fragments, four finger bones, and 11 teeth.

This skeletal array was strewn about 1,000 feet from the cave's small entrance, located at the end of a narrow, winding passageway that requires considerable skill to negotiate. Smudge marks on the cave walls and charcoal fragments on the clay floor suggest that the man entered the earthen chamber with a torch, Watson maintains.

Her team found no ritual objects or other signs of burial in the cave. The cause of the man's death remains unclear, she adds.

Preliminary DNA analysis of a small bone sample shows a genetic arrangement characteristic of some Native American groups now living in regions south of Canada, Watson notes.

Ancient ape swings into kin clash

Dryopithecus, an extinct ape that lived in western and southern Europe between about 9 million and 12 million years ago, finds itself embroiled in a scientific tug-of-war over its evolutionary affiliations.

Based on an analysis of *Dryopithecus* fossils found at a Hungarian site, David R. Begun of the University of Toronto classed the creature as a close relative of later African apes and hominids, the evolutionary family that includes humans (SN: 9/26/92, p.198).

But a study of *Dryopithecus* skull fragments uncovered at a Spanish site in 1991 indicates that the ancient ape shows the closest anatomical ties to the orangutan and its fossil predecessors in Asia. In particular, the cheekbones of *Dryopithecus* and orangutans display a similar thickness and shape, assert paleontologists Salvador Moyà Solà and Melke Köhler of M. Crusafont Institute of Paleontology in Barcelona, Spain.

In the Oct. 7 NATURE, the two investigators offer a theory of how *Dryopithecus* evolved. Perhaps 15 million years ago, an as-yet-unidentified ape traveled from Africa to Eastern Europe and then gradually moved on to Asia, they propose. Variations on that animal's original anatomical theme then evolved in different regions. *Dryopithecus* emerged in Europe, and its fossil relatives *Lufengpithecus* and *Sivapithecus* appeared in China and South Asia, respectively. Remains of the latter two creatures show an even closer resemblance to modern orangutans, the researchers contend.

Controversy over the evolution of *Dryopithecus* will undoubtedly continue, assert Lawrence Martin of the State University of New York at Stony Brook and Peter Andrews of the Natural History Museum in London. Excavations have turned up only a few good facial specimens of *Dryopithecus* and other ancient apes, they write in an accompanying editorial.

Earth Science

Loss of Landsat 6 handicaps research

Efforts to locate the recently launched Landsat 6 satellite have failed thus far to turn up any sign of the $220 million Earth-sensing spacecraft. The loss forces a broad community of researchers, private companies, and government agencies to rely on partially crippled Landsat satellites currently in orbit.

The Oct. 5 launch from Vandenberg Air Force Base in California appeared to go smoothly at first, according to Michael Mignogno of the National Oceanic and Atmospheric Administration in Suitland, Md., which oversaw development of the satellite. Landsat 6 flew on a Titan 2 rocket—a converted ICBM missile—that carried the spacecraft to an altitude of 180 nautical miles before releasing it. What happened after that remains unknown.

The launch plan called for a built-in motor to propel the satellite to its final orbit at 438 nautical miles. However, Landsat 6 failed to communicate with ground stations and could not be located thereafter.

Landsat 6's primary sensor was designed to record images of Earth in seven discrete wavelength bands ranging from visible light to infrared radiation. The loss of Landsat 6 will hit hardest those who need up-to-date images, such as scientists assessing the pace of tropical deforestation or officials mapping land changes after hurricanes.

Landsat 5, launched in 1984 with an expected 3-year lifetime, continues to provide images but has lost part of its ability to transmit data. As a result, the satellite can only send information to Earth when it passes over one of the 17 existing ground stations, limiting the number of regions it can photograph, according to Carla Adam of EOSAT in Lanham, Md., the company that operates the Landsat satellites and distributes images. EOSAT could revive the recently shut down Landsat 4, launched in 1982, but it also suffers communication problems.

With Landsat 4 and 5 operating on borrowed time, it remains unclear whether they can last until Landsat 7 is ready for its planned launch in 1998. The French SPOT satellites also provide images of Earth, but these satellites collect information in only four spectral bands, making them less useful for distinguishing types of forest and rock. The higher-resolution SPOT images also cover a smaller swath of land, which drives up the cost of mapping broad regions.

Weather maps circa 2000 B.C.

By sifting through riverbank deposits in the southwestern United States, a team of geologists has uncovered clues about global weather patterns thousands of years ago. The climate information comes from records of extreme floods, which have left lasting marks along the major rivers in the region.

Geologist Lisa L. Ely of Pennsylvania State University in University Park and her colleagues studied 19 rivers in Arizona and southern Utah and detected evidence of 251 floods during the last 5,800 years. They dated the floods through carbon-14 analysis of organic material and archaeological artifacts preserved in the deposited sediments. Although researchers have traditionally thought that large floods occur at random times, Ely's group found a distinct pattern. The rivers record numerous inundations between 3800 B.C. and 2200 B.C. but none during the next 1,800 years, they report in the Oct. 15 SCIENCE.

The geologists can infer ancient weather patterns from the flooding history because the southwestern United States typically receives its most severe rainfall during years when the tropical Pacific Ocean grows warm, an event called El Niño. The geologic record of floods therefore offers a means of charting the frequency of El Niños, suggests Ely. She and her colleagues think that researchers could reconstruct broad-scale atmospheric circulation patterns by studying the flooding history of rivers at various points around the globe.